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EXAMINER	
DAGER, JONATHAN M	
ART UNIT	**PAPER NUMBER**
3663	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/591,008	ASTRUC, JOEL
	Examiner	Art Unit
	JONATHAN M. DAGER	3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *1-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *29 August 2006*.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 28-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 28 contains the phrases “means for reading”, and “means co-operating”, and, “means for presenting” in the claim language. These embodiments are supported throughout the specification, and the claim language is subsequently treated under 35 USC 112, sixth paragraph. However, the specification fails to set forth the exact structure, or equivalent thereof, that corresponds to the claimed function.

"If the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid the price for use of the convenience of broad claiming afforded by 112, sixth paragraph but is rather attempting to claim in functional terms unbounded by any reference to structure in the specification. If one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112." See Biomedino, LLC v Waters Technologies Corporation (Fed Cir, 2006-1350, 6/18/2007).

Subsequently, dependent claims 29-32 are drawn to the invention of independent claim 8, and are rejected under similar grounds.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 17, 19, 21-26, and 28-32, are rejected under 35 U.S.C. 103(a) as being unpatentable over Dwyer (US 2005/0182528), and further in view of Lapis (US 6,744,382).

Regarding claims 17, 19, and 28-32(as best understood), Dwyer has disclosed an aircraft display system in which potential collision threats can be avoided. Dwyer discloses that the system 100 includes a user interface 102, a processor 104, one or more terrain databases 106, one or more navigation databases 108, a source of weather data 110, a terrain avoidance and warning system (TAWS) 112, a traffic and collision avoidance system (TCAS) 114, various sensors 116, and a display device 118. The user interface 102 is in operable communication with the processor 104 and is configured to receive input from a user 109 (e.g., a pilot) and, in response to the user input, supply command signals to the processor 104. The user interface 102 may be any one, or combination, of various known user interface devices including, but not limited to, a cursor control device (CCD) 107, such as a mouse, a trackball, or joystick, and/or a keyboard, one or more buttons, switches, or knobs. In the depicted embodiment, the user interface 102 includes a CCD 107 and a keyboard 111. The user 109 uses the CCD 107 to, among other things,

move a cursor symbol on the display screen (see FIG. 2), and may use the keyboard 111 to, among other things, input textual data (para 0015).

Thus, Dwyer has disclosed a tool for inputting coordinates and suitable for being manipulated by a pilot.

Dwyer discloses that one or more other external systems (or subsystems) may also provide avionics-related data to the processor 104 for display on the display device 118. In the depicted embodiment, these external systems include a flight director 122, an instrument landing system (ILS) 124, a runway awareness and advisory system (RAAS) 126, and a navigation computer 128. The flight director 122, as is generally known, supplies command data representative of commands for piloting the aircraft in response to flight crew entered data, or various inertial and avionics data received from external systems. The command data supplied by the flight director 122 may be supplied to the processor 104 and displayed on the display device 118 for use by the pilot 109, or the data may be supplied to an autopilot (not illustrated). The autopilot, in turn, produces appropriate control signals which are applied to the aircraft's flight control surfaces to cause the aircraft to fly in accordance with the flight crew entered data, or the inertial and avionics data (para 0020).

The terrain databases 106 include various types of data representative of the terrain over which the aircraft is flying, and the navigation databases 108 include various types of navigation-related data. These navigation-related data include various flight plan related data such as, for example, waypoints, distances between waypoints, headings between waypoints, data related to different airports, navigational aids, obstructions, special use airspace, political boundaries, communication frequencies, and aircraft approach information (para 0016).

Thus, the system and methods of Dwyer can be used in assisting the piloting of an aircraft in the vicinity of a landing or takeoff point, and is capable of taking into account and approach profile. It is also noted from above that the “flight crew entered data” strongly suggests, if not implicitly anticipates, flight plan information including takeoff and landing locations.

The RAAS 126 uses GPS data to determine aircraft position and compares aircraft position to airport location data stored in the navigation database 108. Based on these comparisons, the RAAS 126, if necessary, issues appropriate aural advisories (para 0022).

Thus, the system and method utilizes coordinates stored (GPS information) for a landing or takeoff point input into a computer.

Dwyer discloses that in addition to providing a perspective view of the terrain 220, the system 100 is also preferably configured to provide a perspective view of airport runways, and/or the ILS (integrated landing system) feather associated with each runway, in the vertical situation display 208. An example of a display area 202 that depicts a lateral view and a perspective view of a runway 902 and its associated ILS feather 904 in the lateral situation display 206 and in the vertical situation display 208, respectively, is illustrated in FIG. 9. As FIG. 9 shows, such views provide enhanced situational awareness on the location of the runway 902, the ILS feather 904, and the flight plan 210 and/or flight path, relative to the runway 902 (para 0035).

Thus, it is disclosed that the computer determines the entry locus for a given approach, as well as presenting a diagram including the locus on a display device.

Dwyer discloses that in addition to displaying the highway in the sky as a series of geometric shapes 302, the sizes of which may be selectively displayed based on the RNP and

aircraft vertical accuracy, the system 100 can be configured to selectively change the number of geometric shapes 302 displayed in the vertical situation display 208. In a particular preferred embodiment, the system 100 is configured to change the number of geometric shapes 302 based on the flight phase of the aircraft, and/or the mode in which the aircraft flight director 1xx is operating. For example, when operating in a terminal airspace, it may be desirable to display numerous geometric shapes 302 so as to keep the pilot close to the desired flight plan 210. Conversely, when operating en route, the number of geometric shapes 320 can be fewer since the aircraft is typically operating at an altitude where terrain 220 is likely not a potential threat. In addition, as is shown more clearly in FIG. 5, the number of geometric shapes 302 displayed in the vertical situation display 208 may be increased when the aircraft is intercepting the flight plan 210, to help the pilot 109 perform the intercept. Once the flight path has been intercepted, and the aircraft is on the flight plan 210, both laterally and vertically, the number of geometric shapes 302 displayed may be reduced (para 0032).

Again, what Dwyer is disclosing in the above citations that the processor determines, based on entered flight plan data, a safe entry procedure in which can visually assist the flight crew in safely piloting the aircraft to an approach entry locus (also waypoint entered, see fig. 14 item 214). Further, it is disclosed by Dwyer a vertical profile preprogrammed for the aircraft to follow (see fig. 13, item 1000, para 0038).

Dwyer discloses above that the "geometric shapes" above are used to assist the pilot in accomplishing a safe route. While it may be obvious that all areas outside of said shapes displayed are dangerous loci, it is not explicitly disclosed.

Lapis, however, teaches an apparatus and method for displaying weather and other hazard information to a pilot with additional content which helps a pilot avoid no-fly-zones and to prepare a new flight path through a group of widely scattered thunderstorms. The display shows a no-fly-zone around the storm and the no-fly-zone is depicted differently, depending upon variables, such as distance from the aircraft, velocity of the storm being tracked and others (abstract).

Thus, the method of Lapis teaches automatically determining a potentially dangerous flight condition by prediction of aircraft flight plan intersection with no fly zones. Further, the above teaches changing the flight path.

Lapis teaches in FIG. 1 a display of the present invention, generally designated 100, having an aircraft 102 shown with a group of concentric iso-range lines 104. The display 100 is shown depicting a first storm cell current location 110 with a first storm cell current NFZ 112 disposed about it. First storm cell current NFZ 112 can be configured in many ways, including a polygon, an ellipse, a circle (ellipse with co-located foci) or other shapes 9column 2 lines 49-57).

Thus, the aircraft can determine loci that are not safe for attaining a desired flight path, and displaying said loci on an in-vehicle display.

Both inventions are drawn to aircraft safety systems that use integrated avionics to determine a potentially hazardous situation for an aircraft. Both display the calculated dangerous, and also have means for displaying them. Both use preprogrammed flight plans as well as rerouting features to avoid potential threats.

All of the components and methods are known in the above prior art. The only difference is a combination of these elements into a single device.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the display indicators of Lapis onto the base invention of Dwyer, since both systems could be used in combination to produce the predictable result of a display presenting a diagram of unsafe locations for entry into a given phase of a flight plan.

Combining prior art elements according to known methods to yield predictable results is a rationale to support a conclusion of obviousness. See MPEP 2143(A).

Regarding claims 21 and 35, Dwyer discloses that the data supplied from the TCAS 114 includes data representative of other aircraft in the vicinity, which may include, for example, speed, direction, altitude, and altitude trend. In a preferred embodiment, the processor 104, in response to the TCAS data, supplies appropriate display commands to the display device 118 such that a graphic representation of each aircraft in the vicinity is displayed on the display device 118. The TAWS 112 supplies data representative of the location of terrain that may be a threat to the aircraft. The processor 104, in response to the TAWS data, preferably supplies appropriate display commands to the display device 118 such that the potential threat terrain is displayed in various colors depending on the level of threat. For example, red is used for warnings (immediate danger), yellow is used for cautions (possible danger), and green is used for terrain that is not a threat. It will be appreciated that these colors and number of threat levels are merely exemplary, and that other colors and different numbers of threat levels can be provided as a matter of choice (para 0019).

Regarding claim 22, Dwyer discloses that in addition to displaying the perspective vertical situation view 224 of the terrain 220, the vertical situation display 208 may also simultaneously display indicia representative of the current flight plan 210 of the aircraft. These indicia may be displayed in any one of numerous forms. For example, in the embodiment shown in FIG. 2, the flight plan 210 is displayed as a substantially transparent ribbon 226. The transparent ribbon 226 represents the lateral and vertical path of the flight plan 210 being flown (or to be flown). In a particular preferred embodiment, the width (W.sub.ribbon) and height (H.sub.ribbon) of the flight plan ribbon 226 are based on the lateral error uncertainty (EU) and the vertical accuracy of the aircraft, respectively. As is generally known, the lateral EU is the 95% probability of error in the lateral position of the aircraft. Thus, in such an embodiment, the width (W.sub.ribbon) of flight plan ribbon 236 is equal to the EU (e.g., W.sub.ribbon=EU) (para 0029).

In such an embodiment, the flight plan 210 is displayed as a series of geometric shapes 302 such as, for example, boxes, squares, rectangles, or circles, through which the pilot is to fly the aircraft. An exemplary embodiment of the vertical situation display 208 depicting the highway in the sky as a series of rectangles 302 in the perspective vertical situation view 224 is shown in FIG. 3. In a particular preferred embodiment, the size of each rectangle 302 is based on the required navigational performance (RNP) and the maximum allowed vertical error for the airspace in which the aircraft is operating (e.g., "oceanic," "en route," "terminal," or "approach"). In particular, the width (W.sub.rect) of each rectangle 302 is based on the RNP, and the height (H.sub.rect) of each rectangle 302 is based on the maximum allowed vertical error. For example, when an aircraft is operating in a terminal airspace, which is a radar, air traffic controller (ATC)

controlled airspace, the RNP is typically .+-.1 NM (nautical mile), and the maximum allowed vertical error is typically .+-.300 feet. Thus, each rectangle 302 in the flight plan 210 for this airspace would be 1 NM wide, and 300 feet high. As shown in FIG. 4, and as was just noted, the flight plan ribbon 226 could be displayed along with the series of rectangles 302. In such an embodiment, the flight plan ribbon 226 passes through the rectangles 302 that define the RNP and vertical accuracy of the aircraft (para 0030).

Regarding claims 23-26, the above Dwyer clearly teaches a rectilinear segment, as well as multiple segments in alignment, in the horizontal profile (see fig. 4 item 226) and vertical profile (see fig. 13 item 210).

3. Claims 18 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Dwyer and Lapis, as applied to claim 1 above, and further in view of Silberman (US 7,321,812).

Regarding claims 18 and 33, the inventions of Dwyer and Lapis, as combined above does teach a limit curve segment corresponding to altitude profile, but merely teaches collision avoidance, i.e. it is not taught "grazing" or bearing against an obstacle extending in the vicinity of the landing or takeoff point (see Dwyer, fig. 13).

Silberman, however, teaches a method of designing a terrain-following flight profile for an air vehicle. The method includes providing a terrain profile, and transforming the terrain profile into the terrain-following flight profile according to one or more performance parameter of the air vehicle (abstract).

Silberman teaches that FIG. 2B shows a terrain profile segment 22' such that when filtering line segment 24 first contacts terrain profile segment 22', this contact is at two points 30 and 32. In this case, the portion of filtering line segment 24 between pivot point 26 and the rightmost point of contact (point 32) is taken as the corresponding line segment of the piecewise linear envelope. Point 32 then becomes the next pivot point, for constructing the next line segment of the piecewise linear envelope. FIG. 2C shows a terrain profile segment 22" that is similar to terrain profile segment 22' except that instead of point 32, terrain profile segment 22" has a point 32' that is below filtering line segment 24 when filtering line segment 24 reaches point 30. In this case, the portion of filtering line segment 24 between pivot point 26 and the single point of contact (point 30) is taken as the corresponding line segment of the piecewise linear envelope; and point 30 then becomes the next pivot point (column 9 lines 25-40).

Thus, it is taught a method of low-altitude flying wherein the vertical flight path can contact the top of an obstacle.

All of the components and methods are known in the above prior art. The only difference is a combination of these elements into a single device.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the display indicators of Silberman onto the combination of Dwyer and Lapis, since all systems could be used in combination to produce the predictable result of a display presenting a vertical profile that would touch landmark features.

Combining prior art elements according to known methods to yield predictable results is a rationale to support a conclusion of obviousness. See MPEP 2143(A).

4. Claims 20, 27, 34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Dwyer and Lapis, as applied to claims 17 and 19 above, and further in view of Rogers (US 2005/0206533).

Regarding claims 20, 27, and 34, the above combination does teach a plurality of "geometric shapes" focused on a point, displayed on the display device, and a diagram including the landing or takeoff point. Additionally, Dwyer discloses one circle centered in on a point and the limit curve. It is not taught in the above art a portion of one or more circles centered on the point for landing/takeoff.

Further, Dwyer discloses that In such an embodiment, the flight plan 210 is displayed as a series of geometric shapes 302 such as, for example, boxes, squares, rectangles, or circles, through which the pilot is to fly the aircraft. An exemplary embodiment of the vertical situation display 208 depicting the highway in the sky as a series of rectangles 302 in the perspective vertical situation view 224 is shown in FIG. 3. In a particular preferred embodiment, the size of each rectangle 302 is based on the required navigational performance (RNP) and the maximum allowed vertical error for the airspace in which the aircraft is operating (e.g., "oceanic," "en route," "terminal," or "approach"). In particular, the width (W.sub.rect) of each rectangle 302 is based on the RNP, and the height (H.sub.rect) of each rectangle 302 is based on the maximum allowed vertical error. For example, when an aircraft is operating in a terminal airspace, which is a radar, air traffic controller (ATC) controlled airspace, the RNP is typically .+-.1 NM (nautical mile), and the maximum allowed vertical error is typically .+-.300 feet. Thus, each rectangle 302 in the flight plan 210 for this airspace would be 1 NM wide, and 300 feet high. As shown in FIG.

4, and as was just noted, the flight plan ribbon 226 could be displayed along with the series of rectangles 302. In such an embodiment, the flight plan ribbon 226 passes through the rectangles 302 that define the RNP and vertical accuracy of the aircraft (para 0030).

Rogers teaches a symbology system is provided for programming information relative to an aircraft's 10 future position and flight path to create a symbology representing the future position 36, and 40 including the flight path 31-35 and ground path 20 of the aircraft 10 in the visual field of a pilot (para 0041).

The symbology for the flight path comprises a series of virtual FIGS. 31-35 (sic) at spaced intervals in front of the aircraft 10 delineating the projected flight path of the aircraft 10 and virtual figures of various shapes and colors with other information about the future predicted position 20, 36 and 40 of the aircraft 10 based on the present real time path of travel of the aircraft 10. The symbology is capable of providing visual real time information to the pilot regarding points of future positions and flight path 31-35 at given time intervals of the aircraft 10 relative to the actual surrounding environment and visual real time information about a predicted future contact 36 of the aircraft 10 with any objects in the environment, including the ground 50, all superimposed on the actual terrain in the visual field of the pilot (0043).

Thus, it is taught a method of navigation wherein circles are used to focus in on a landing point.

All of the components and methods are known in the above prior art. The only difference is a combination of these elements into a single device.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to simply substitute the display indicators of Rogers onto the combination of Dwyer

and Lapis, since all systems could be used in combination to produce the predictable result of a display presenting one or more circles centered in on a point on the ground.

Combining prior art elements according to known methods to yield predictable results is a rationale to support a conclusion of obviousness. See MPEP 2143(A).

Simple substitution of one known element for another to obtain predictable results will support a conclusion of obviousness. See MPEP 2143 (B).

Regarding claim 36, Dwyer discloses that the data supplied from the TCAS 114 includes data representative of other aircraft in the vicinity, which may include, for example, speed, direction, altitude, and altitude trend. In a preferred embodiment, the processor 104, in response to the TCAS data, supplies appropriate display commands to the display device 118 such that a graphic representation of each aircraft in the vicinity is displayed on the display device 118. The TAWS 112 supplies data representative of the location of terrain that may be a threat to the aircraft. The processor 104, in response to the TAWS data, preferably supplies appropriate display commands to the display device 118 such that the potential threat terrain is displayed in various colors depending on the level of threat. For example, red is used for warnings (immediate danger), yellow is used for cautions (possible danger), and green is used for terrain that is not a threat. It will be appreciated that these colors and number of threat levels are merely exemplary, and that other colors and different numbers of threat levels can be provided as a matter of choice (para 0019).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN M. DAGER whose telephone number is (571)270-1332. The examiner can normally be reached on 0830-1800 (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JD
17 February 2009

/Jack W. Keith/
Supervisory Patent Examiner, Art Unit 3663